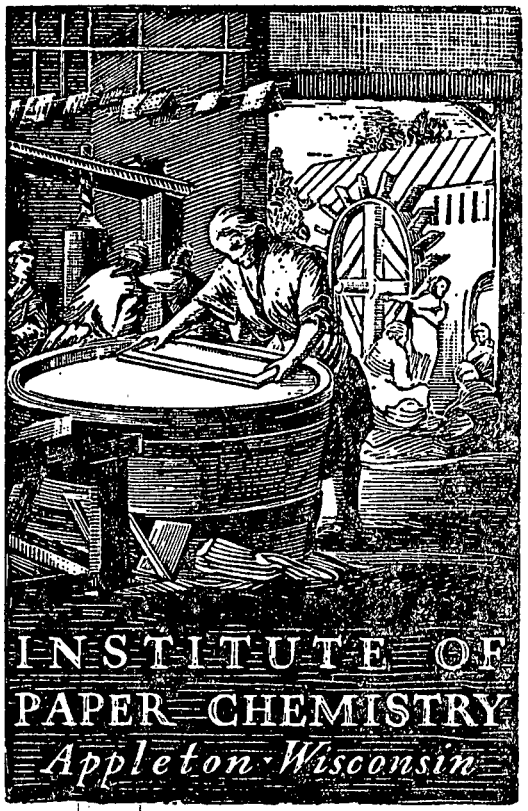

CONTINUOUS BASE-LINE STUDY

Project 1108-13

Report 193

A Progress Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

February 1, 1965

Your mills are identified by the following code letters in this report:

Mill	Code Letter
Jacksonville	W
Valdosta	V

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS BASE-LINE STUDY

Project 1108-13

Report 193

A Progress Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

February 1, 1965

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THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS BASE-LINE STUDY

INTRODUCTION

As requested by the Technical Division of the Fourdrinier Kraft Board Institute, Inc., the reports pertinent to the continuous base-line study on 42-lb. fourdrinier kraft linerboard have been prepared by The Institute of Paper Chemistry on a bimonthly basis instead of the previous monthly basis since August 1, 1961. The current report presents results obtained during the months of December, 1964 and January, 1965.

PRESENTATION AND DISCUSSION OF TEST RESULTS

Each sample lot received for evaluation during December and January was evaluated for basis weight, caliper, bursting strength, and Elmendorf tearing strength. The average strength results for each mill may be seen in Table I and are graphically presented in Fig. 1 to 5. In addition to a comparison of the current mill averages for the various tests, Table I also shows the current F.K.I. averages, the cumulative F.K.I. averages, and F.K.I. indexes. For each test, the current mill average represents the average obtained on all sample lots evaluated from a given mill during the current period, the current F.K.I. average represents the average of the current mill averages, and the cumulative F.K.I. average represents the average of the current F.K.I. averages for the previous twelve months excluding the current period. The F.K.I. index expressed in per cent is the ratio of the current F.K.I. average to the cumulative F.K.I. average.

In Table II, a tabulation of the number of sample lots submitted by each mill during the current period is shown.

Supplementary to the summary of basis weight data given in Table I, a tabulation is given in Table III of the amount by which the current basis weight average for each mill varies from the 42-lb. specification set forth in Rule 41.

Shown below from Table I are the maximum and minimum current mill averages and also the current and cumulative F.K.I. averages for each test.

TABLE I

SUMMARY OF COMPOSITE MILL AVERAGES--DECEMBER, 1964, AND JANUARY, 1965

Mill	Basis Weight, lb.	Caliper, points,	Bursting Strength, p.s.i.g.	Elmendorf Tear, g./sheet	
				In Machine	Cross Machine
A	43.0	12.4	110	376	412
B	43.2	13.4	109	399	426
C	42.4	12.7	116	337	368
D	42.3	12.8	114	326	397
E	No samples submitted.				
F	42.3	12.9	104	318	366
G	42.8	13.2	110	336	398
H	42.2	12.8	111	329	387
I	No samples submitted.				
J	42.9	12.3	118	341	361
K	42.4	12.9	111	293	353
L	42.4	12.1	117	311	364
M	42.9	12.6	112	338	399
N	42.2	12.6	118	374	412
O	No samples submitted.				
P	42.4	12.2	117	340	386
Q	42.9	11.8	107	365	386
S	42.6	12.8	112	323	368
T	43.6	12.6	110	350	382
U	42.2	12.4	111	309	382
V Val.	42.5	12.5	106	391	408
W Jaf.	42.8	11.4	107	370	415
X	42.2	12.8	112	286	335
Current FKI average:	42.6	12.6	112	341	385
Cumulative FKI average:	42.8	12.7	111	334	381
FKI Index, %	99.5	99.2	100.9	102.1	101.0

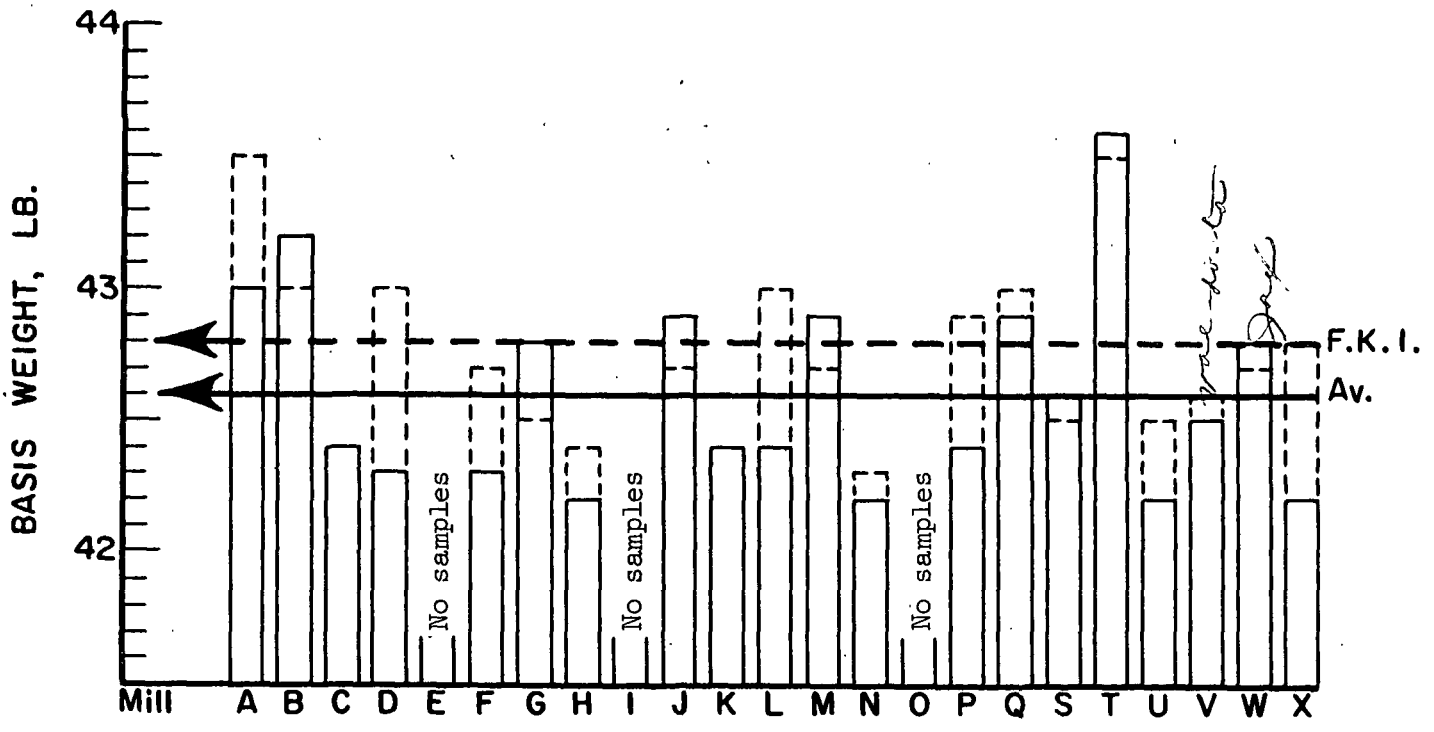

Figure 1. Comparison of Basis Weight Results

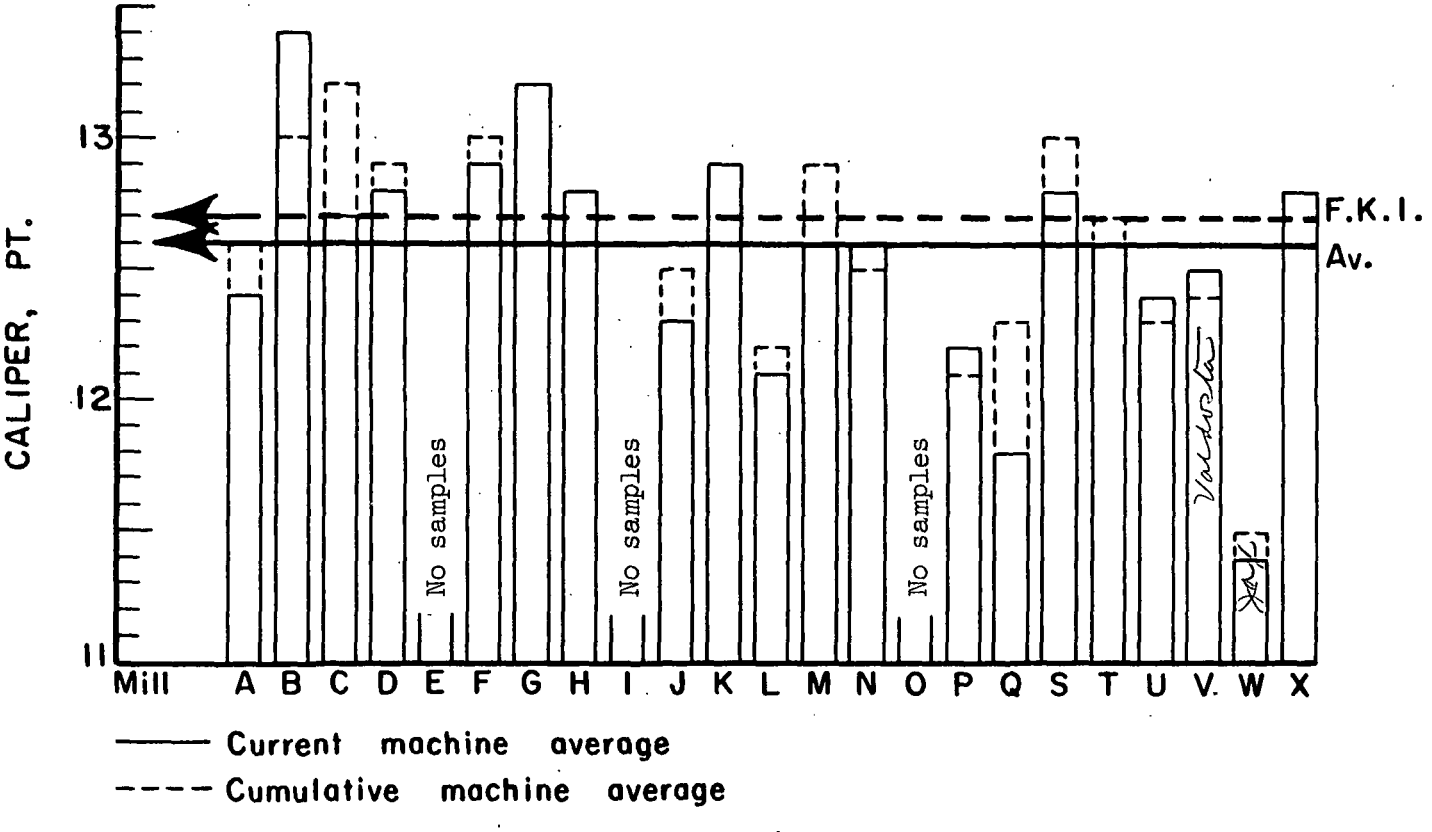

Figure 2. Comparison of Caliper Results

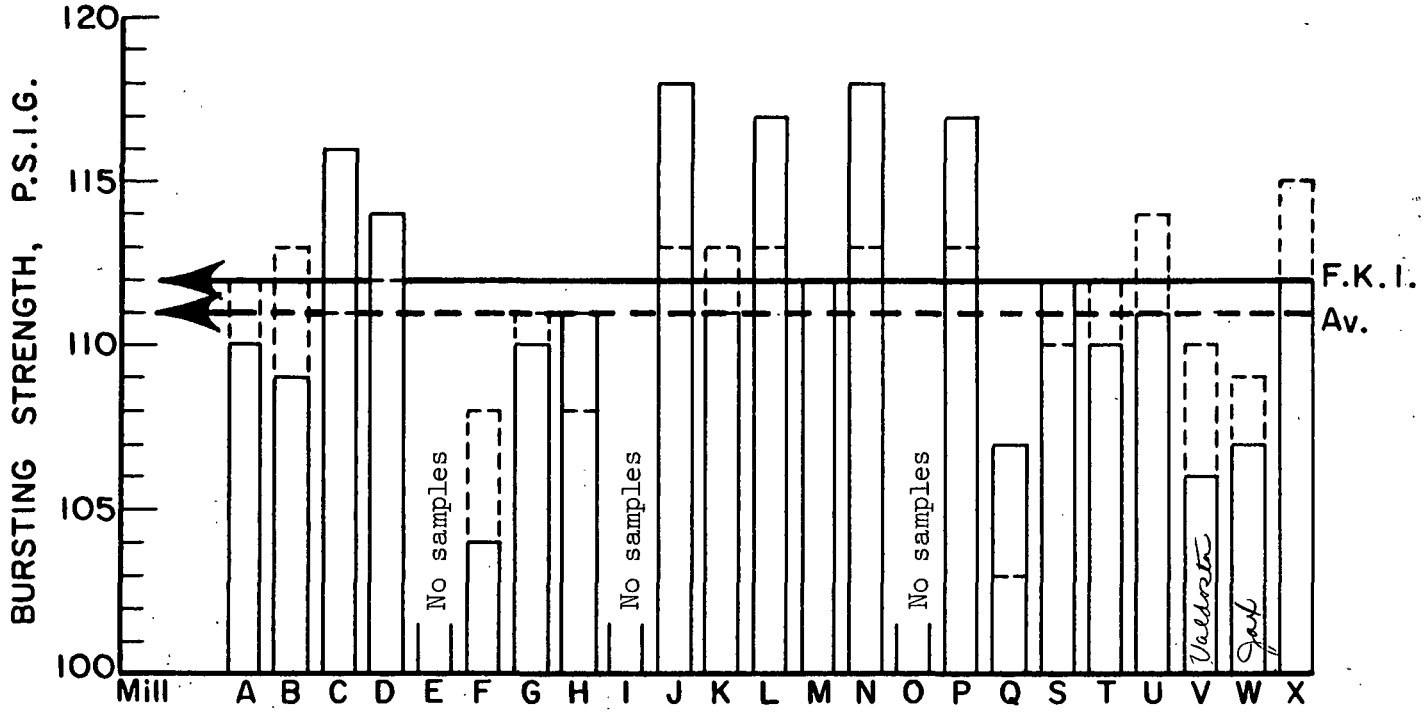

Figure 3. Comparison of Bursting Strength Results

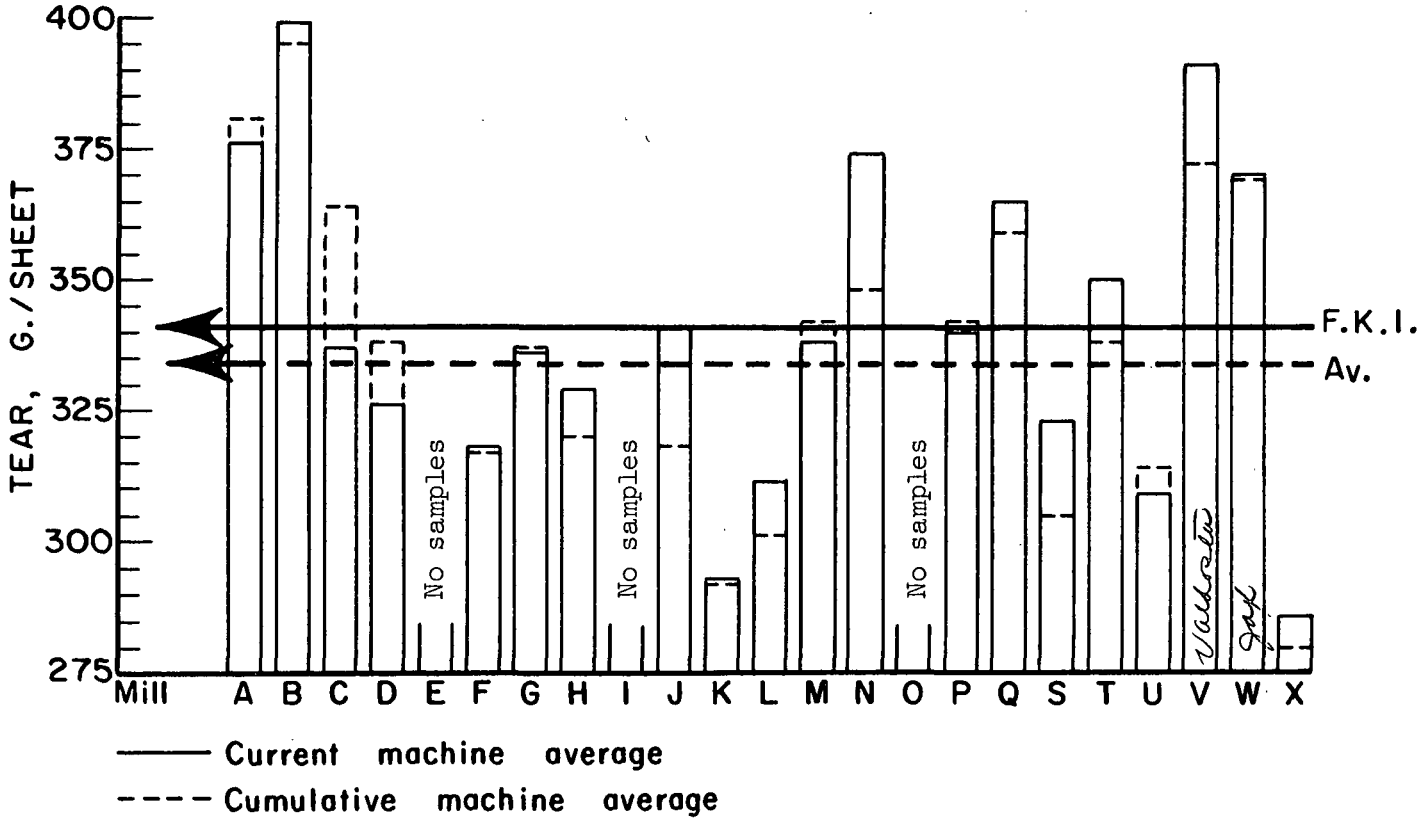

Figure 4. Comparison of Machine-Direction Tear Results

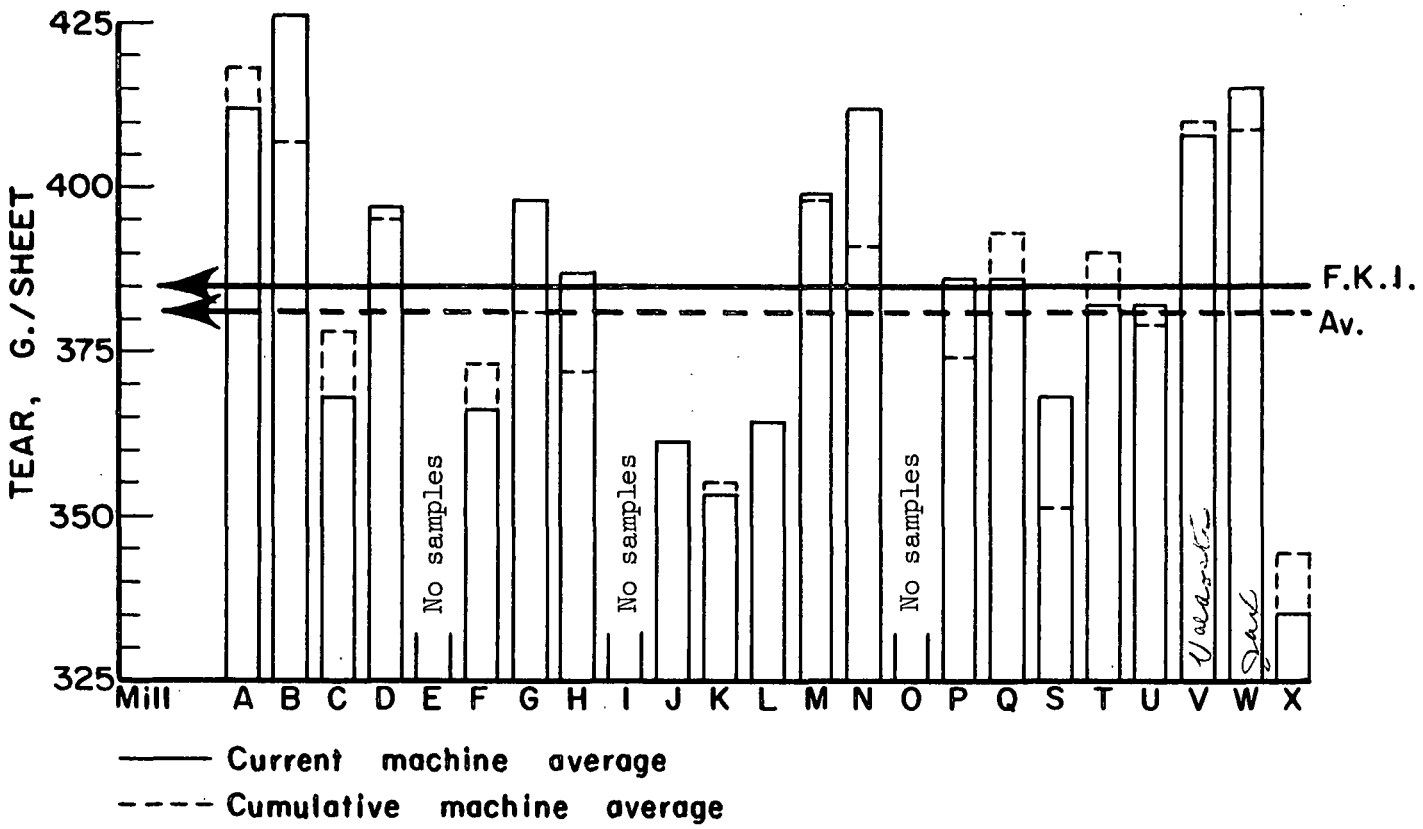

Figure 5. Comparison of Cross-Machine Direction Tear Results

TABLE II

NUMBER OF SAMPLE LOTS SUBMITTED BY EACH MILL
DURING DECEMBER, 1964, AND JANUARY, 1965

Mill Code	Number of Sample Lots
A	8
B	4
C	3
D	6
E	0
F	11
G	7
H	8
I	0
J	8
K	6
L	10
M	8
N	3
O	0
P	4
Q	7
S	8
T	3
U	8
V Val.	5
W Jaf	6
X	3
Total	126

TABLE III

PERCENTAGE DEVIATION OF CURRENT MILL AVERAGES FROM 42-LB. BASIS WEIGHT SPECIFICATION FOR DECEMBER, 1964, AND JANUARY, 1965

Mill Code	Percentage Deviation
A	+2.4
B	+2.9
C	+1.0
D	+0.7
E	--
F	+0.7
G	+1.9
H	+0.5
I	--
J	+2.1
K	+1.0
L	+1.0
M	+2.1
N	+0.5
O	--
P	+1.0
Q	+2.1
S	+1.4
T	+3.8
U	+0.5
V Val	+1.2
W Jaf	+1.9
X	+0.5

Test	Current Mill Averages Max.	Min.	F.K.I. Averages Current	Cumulative
Basis Weight, lb.	43.6	42.2	42.6	42.8
Caliper, points	13.4	11.4	12.6	12.7
Bursting Strength, p.s.i.g.	118	104	112	111
Machine Direction Elmendorf Tear, g./sheet	399	286	341	334
Cross-Machine Direction Elmendorf Tear, g./sheet	426	335	385	381

The test results obtained at the Institute and at the mill during December and January are given alphabetically in Tables IV to XXVI for each mill. Included in each of these tables are the maximum, minimum, and average test data obtained at the Institute on each sample lot of linerboard. The data obtained at the Institute include also for each test the calculation of (1) a current mill average that represents the mean of the averages obtained on the individual sample lots of linerboard evaluated during the current period, (2) a cumulative mill average that represents the mean of the current mill averages for the previous twelve months excluding the current period, (3) a mill factor expressed in per cent that represents the ratio of the current mill average to the cumulative mill average, and (4) a mill index expressed in per cent that represents the ratio of the current mill average to the cumulative F.K.I. average. The term "mean" in the preceding discussion is synonymous with the simple arithmetic average. As mentioned above, the results presented in Tables IV to XXVI also include data obtained at the mills. The mill data include for each test (1) the average result obtained on each sample lot of linerboard and (2) a current mill average (calculated at the Institute) that represents the mean of the averages obtained on the individual sample lots of linerboard. In addition to the presentations of Institute and mill

TABLE IV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL A

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb. Institute Max.	Min.	Av.	Mill Av.	Diff.	Caliper, points Institute Max.	Min.	Av.	Mill Av.	Diff.	Bursting Strength, p.s.i.g. Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet In Machine Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet Cross Machine Institute Max.	Min.	Av.	Mill Av.	Diff.
11-11-64	----	2	44.0	42.0	43.2	42.9	-0.3	13.0	11.3	12.2	12.2	0.0	124	78	109	103	-6	416	320	363[a]	---	---	496	352	434[a]	---	---
11-17-64	----	1	44.2	42.2	43.5	43.2	-0.3	12.5	11.0	11.8	12.0	+0.2	121	90	110	110	0	432	336	391[a]	---	---	464	376	421[a]	---	---
11-23-64	----	2	42.8	41.2	42.0	42.0	0.0	13.4	12.1	12.6	12.5	-0.1	127	84	105	100	-5	400	336	365	---	---	448	368	399[a]	---	---
11-25-64	----	1	44.0	42.2	43.4	43.6	+0.2	13.0	11.8	12.3	12.5	+0.2	130	85	104	105	+1	416	352	373	---	---	448	352	401[a]	---	---
12- 7-64	----	2	44.2	42.4	43.4	42.9	-0.5	13.1	12.1	12.7	12.5	-0.2	128	88	111	106	-5	464	336	385	---	---	464	384	440[a]	---	---
12- 8-64	----	1	43.6	39.8	42.3	42.2	-0.1	12.3	11.1	11.9	11.7	-0.2	140	101	118	112	-6	400	320	356[a]	---	---	432	352	394[a]	---	---
1-12-65	----	1	45.6	42.0	43.5	43.4	-0.1	13.7	12.1	13.0	12.6	-0.4	140	80	112	109	-3	432	352	376[a]	---	---	432	352	395[a]	---	---
1-12-65	----	2	43.8	40.6	42.5	42.3	-0.2	13.0	12.2	12.7	12.2	-0.5	136	87	113	113	0	464	288	395	---	---	496	384	417[a]	---	---
Current mill average:					43.0	42.8	-0.2			12.4	12.3	-0.1			110	107	-3			376					412		
Cumulative mill average:					43.5					12.6					112					381					418		
Mill factor, %					98.9					98.4					98.2					98.7					98.6		
Mill index, %					100.5					97.6					99.1					112.6					108.1		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE V

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL B

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
12-11-64	W.F.	-	44.2	41.8	43.1	42.7	-0.4	14.3	13.0	13.4	13.7	+0.3	122	79	103	106	+3	480	328	390[a]	363	-27	496	384	435[a]	441	+ 6
12-17-64	W.F.	-	44.2	40.4	42.6	42.9	+0.3	14.6	12.1	13.3	13.4	+0.1	122	86	108	105	-3	472	344	403[a]	358	-45	488	352	426[a]	424	- 2
1- 4-65	W.F.	-	44.6	42.8	43.8	44.3	+0.5	14.0	12.8	13.6	13.6	0.0	127	90	110	111	+1	512	336	394[a]	388	- 6	464	400	433[a]	423	-10
1- 4-65	W.F.	-	44.8	42.0	43.5	43.6	+0.1	14.0	12.6	13.3	13.6	+0.3	137	86	114	111	-3	448	368	409[a]	379	-30	464	368	409[a]	416	+ 7
Current mill average:					43.2	43.4	+0.2			13.4	13.6	+0.2			109	108	-1			399	372	-27			426	426	0
Cumulative mill average:					43.0					13.0					113					395					407		
Mill factor, %					100.5					103.1					96.5					101.0					104.7		
Mill index, %					100.9					105.5					98.2					119.5					111.8		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE VI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL C

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
12-10-64	----	-	43.4	41.8	42.3	42.0	-0.3	13.7	12.4	12.9	12.6	-0.3	137	89	114	114	0	392	296	353[a]	---	---	408	328	358[a]	---	---
12-30-64	----	-	42.2	40.0	41.6	41.6	0.0	13.2	12.0	12.6	12.3	-0.3	141	84	115	114	-1	384	280	326[a]	---	---	408	344	377[a]	---	---
1-11-65	----	-	44.0	41.8	43.2	42.7	-0.5	13.1	12.2	12.8	12.3	-0.5	136	101	119	119	0	384	256	332	---	---	432	320	369[a]	---	---
Current mill average:					42.4	42.1	-0.3			12.7	12.4	-0.3			116	116	0			337					366		
Cumulative mill average:					42.4					13.2					111					364					378		
Mill factor, %					100.0					96.2					104.5					92.6					97.4		
Mill index, %					99.1					100.0					104.5					100.9					96.6		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE VII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL D

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb. Institute Max.	Min.	Av.	Mill Av.	Diff.	Caliper, points Institute Max.	Min.	Av.	Mill Av.	Diff.	Bursting Strength, p.s.i.g. Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet In Machine Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet Cross Machine Institute Max.	Min.	Av.	Mill Av.	Diff.
11-26-64	W.F.	2	44.0	42.4	43.8	43.7	-0.1	13.8	12.4	13.2	13.4	+0.2	130	90	113	111	-2	384	272	334	337	+ 3	448	368	420[a]	428	+ 8
11-26-64	W.F.	2	44.4	42.4	43.8	43.8	0.0	13.9	13.0	13.5	13.5	0.0	142	89	115	111	-4	416	304	351	346	- 5	488	392	434[a]	428	- 6
12- 2-64	W.F.	2	42.0	40.2	41.5	41.7	+0.2	13.1	12.5	12.8	12.9	+0.1	133	91	114	110	-4	352	272	311	290	-21	464	344	373[a]	363	-10
12- 2-64	W.F.	2	42.0	40.0	41.4	41.7	+0.3	13.0	12.4	12.8	12.9	+0.1	134	91	113	110	-3	400	256	323	304	-19	400	320	367[a]	370	+ 3
12-14-64	W.F.	2	42.2	40.8	41.8	41.6	-0.2	12.8	11.9	12.3	12.5	+0.2	141	101	116	112	-4	368	272	307	317	+10	432	352	391[a]	400	+ 9
12-14-64	W.F.	2	42.2	40.2	41.6	41.7	+0.1	12.8	11.8	12.3	12.5	-0.2	141	84	113	111	-2	384	272	331[a]	316	-15	448	352	397[a]	384	-13
Current mill average:					42.3	42.4	+0.1			12.8	13.0	+0.2			114	111	-3			326	318	- 8			397	395	- 2
Cumulative mill average:					43.0					12.9					112					336					395		
Mill factor, %					98.4					99.2					101.8					96.4					100.5		
Mill index, %					98.8					100.8					102.7					97.6					104.2		

TABLE VIII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL E

No samples submitted.

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE IX

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL F

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
10-27-64	----	1	44.0	42.0	43.0	43.1	+0.1	13.5	12.1	12.9	13.1	+0.2	132	88	109	109	0	344	240	294	276	-18	368	312	340[a]	363	+23
11- 9-64	----	1	42.8	40.0	41.4	42.0	-0.6	13.3	12.2	12.8	12.8	0.0	119	84	100	105	+5	336	264	303	263	-40	344	296	323[a]	328	+ 5
11-16-64	----	1	42.4	40.8	41.9	41.5	-0.4	12.9	11.6	12.1	12.1	0.0	120	84	102	110	+8	320	240	285	275	-10	400	320	371[a]	376	+ 5
11-29-64	----	1	43.8	42.0	43.1	42.8	-0.3	14.1	12.1	13.1	12.3	-0.8	118	85	103	112	+9	384	256	327	265	-62	448	336	393[a]	359	-34
11-29-64	----	1	43.0	41.8	42.3	42.3	0.0	14.1	12.1	13.1	12.7	-0.4	134	81	103	108	+5	352	256	307	267	-40	392	344	373[a]	350	-23
12- 1-64	----	1	43.3	42.1	42.8	43.0	+0.2	13.8	12.5	13.3	12.8	-0.5	118	89	104	108	+4	364	312	352	276	-76	432	320	371[a]	332	-39
12-17-64	----	1	43.8	42.0	42.9	42.4	-0.5	15.0	13.0	14.0	13.9	-0.1	129	78	102	107	+5	392	272	326[a]	280	-46	424	376	399[a]	354	-45
12-22-64	----	1	42.4	41.6	42.0	42.3	+0.3	13.2	12.5	12.9	12.8	-0.1	129	77	94	98	+4	384	288	331	318	-13	400	304	345[a]	343	- 2
12-29-64	----	1	43.8	42.0	42.8	42.6	-0.2	13.1	12.0	12.6	12.5	-0.1	128	89	104	106	+2	416	288	336	313	-23	384	304	357[a]	368	+11
1- 4-65	----	1	42.2	40.2	41.4	41.5	+0.1	12.9	11.7	12.2	12.1	-0.1	136	92	110	112	+2	336	272	300	286	-14	416	352	384[a]	368	-16
1- 4-65	----	1	42.8	41.4	42.0	42.0	0.0	13.1	11.6	12.5	12.2	-0.3	120	88	107	103	-4	384	288	333[a]	294	-39	448	336	365[a]	352	-13
Current mill average:					42.3	42.3	0.0			12.9	12.7	-0.2			104	107	+3			318	283	-35			366	354	-12
Cumulative mill average:					42.7					13.0					108					317					373		
Mill factor, %					99.1					99.2					96.3					100.3					98.1		
Mill index, %					98.8					101.6					93.7					95.2					96.1		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE X

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL G

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
11-15-64	WFlS	1	43.6	41.4	42.5	43.0	+0.5	13.9	12.6	13.1	12.6	-0.5	129	90	107	104	-3	400	272	328	361	+33	432	336	384[a]	402	+18
11-22-64	WFlS	1	43.8	42.2	43.0	43.2	+0.2	13.6	12.2	12.8	12.7	-0.1	132	95	116	114	-2	368	304	335	328	- 7	416	352	385[a]	403	+18
11-30-64	WFlS	1	44.0	43.0	43.7	43.3	-0.4	14.1	12.4	13.2	12.8	-0.4	144	105	122	117	-5	392	280	344[a]	375	+31	440	344	399[a]	430	+31
12- 7-64	WFlS	1	43.2	41.8	42.2	42.3	+0.1	14.0	12.6	13.2	12.9	-0.3	123	78	104	106	+2	384	304	346[a]	323	-23	448	384	413[a]	397	-16
12-16-64	WFlS	1	43.2	41.6	42.6	42.6	0.0	14.0	12.5	13.3	13.0	-0.3	130	90	108	106	-2	416	272	335[a]	334	- 1	456	352	406[a]	396	-10
12-28-64	WFlS	1	44.0	42.2	43.1	43.1	0.0	14.9	12.9	13.7	13.3	-0.4	138	86	108	106	-2	392	312	343	347	+ 4	432	344	389[a]	403	-14
1- 6-65	WFlS	1	43.6	41.8	42.6	42.8	+0.2	13.8	12.4	13.0	12.6	-0.4	124	88	105	107	+2	384	272	318	336	+18	544	352	407[a]	385	-22
Current mill average:					42.8	42.9	+0.1			13.2	12.8	-0.4			110	109	-1			336	344	+ 8			398	402	+ 4
Cumulative mill average:					42.5					13.2					111					337					381		
Mill factor, %					100.7					100.0					99.1					99.7					104.5		
Mill index, %					100.0					103.9					99.1					100.6					104.5		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL H

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb. Institute Max.	Min.	Av.	Mill Av.	Diff.	Caliper, points Institute Max.	Min.	Av.	Mill Av.	Diff.	Bursting Strength, p.s.i.g. Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet In Machine Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet Cross Machine Institute Max.	Min.	Av.	Mill Av.	Diff.
11- 6-64	W.F.	1	43.6	41.6	42.1	42.8	+0.7	13.9	12.7	13.2	13.2	0.0	134	85	112	112	0	416	272	351	315	-36	448	336	386[a]	406	+20
11- 8-64	W.F.	1	43.6	41.0	42.0	42.2	+0.2	13.8	12.4	13.2	13.1	-0.1	127	89	109	110	+1	384	272	330[a]	315	-15	464	336	397[a]	383	-14
11-15-64	W.F.	1	43.2	40.4	41.7	41.9	+0.2	13.1	12.0	12.6	12.5	-0.1	128	93	110	113	+3	392	272	333[a]	321	-12	456	336	386[a]	402	+16
11-19-64	W.F.	1	42.0	40.8	41.4	41.7	-0.3	12.9	12.1	12.5	12.3	-0.2	123	86	110	112	+2	384	240	315[a]	302	-13	416	336	371[a]	393	-22
12- 9-64	W.F.	1	42.8	41.4	42.0	42.2	-0.2	13.5	12.0	12.8	12.7	-0.1	126	86	105	109	+4	400	272	355[a]	298	-57	400	368	383[a]	357	-26
12- 9-64	W.F.	1	42.6	41.0	42.0	42.2	-0.2	13.3	12.2	12.9	12.9	0.0	120	95	110	108	-2	360	264	307[a]	286	-21	432	352	388[a]	352	-36
12- 9-64	W.F.	1	43.4	41.6	42.4	42.6	-0.2	13.2	12.1	12.9	12.8	-0.1	138	100	116	112	-4	408	288	323[a]	304	-19	416	368	383[a]	368	-15
12-14-64	D.F.	1	44.2	43.0	43.7	43.3	-0.4	13.0	11.7	12.3	12.2	-0.1	141	99	115	114	-1	352	304	321	285	-36	432	360	401[a]	382	-19
Current mill average:					42.2	42.4	-0.2			12.8	12.7	-0.1			111	111	0			329	303	-26			387	380	- 7
Cumulative mill average:					42.4					12.8					108					320					372		
Mill factor, %					99.5					100.0					102.8					102.8					104.0		
Mill index, %					98.6					100.8					100.0					98.5					101.6		

TABLE XII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL I

No samples submitted.

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XIII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL J

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb. Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.	Caliper, points Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.	Bursting Strength, p.s.i.g. Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet In Machine Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet Cross Machine Institute Max.	Institute Min.	Institute Av.	Mill Av.	Diff.
12- 3-64	M.F.	-	42.6	41.8	42.3	42.4	+0.1	12.4	11.7	12.1	13.0	-0.1	142	89	119	118	-1	368	264	319[a]	310	- 9	456	304	375[a]	352	-23
12- 4-64	M.F.	-	44.2	43.8	44.0	44.0	0.0	12.7	11.9	12.3	12.1	-0.2	151	100	125	126	+1	352	304	325	317	- 8	424	360	383[a]	371	-12
12-11-64	M.F.	-	42.0	41.4	41.8	41.9	+0.1	12.7	12.0	12.2	13.1	-0.1	125	84	106	103	-3	416	320	361[a]	327	-34	432	288	349[a]	319	-30
12-18-64	M.F.	-	44.0	43.4	43.8	43.4	-0.4	13.3	12.0	12.8	12.3	-0.5	139	106	121	117	-4	400	288	337	303	-34	424	352	387[a]	357	-30
12-30-64	M.F.	-	42.2	41.8	42.0	42.3	-0.3	12.8	12.0	12.3	12.6	+0.3	138	92	118	118	0	392	280	331[a]	315	-16	400	320	347[a]	333	-14
12-31-64	M.F.	-	43.8	43.0	43.4	43.2	-0.2	12.5	11.9	12.1	12.3	+0.2	132	69	109	106	-3	416	320	367[a]	349	-18	376	312	341[a]	341	0
1- 8-65	M.F.	-	43.4	42.0	42.4	43.2	-0.8	12.1	11.6	11.8	11.8	0.0	146	106	126	123	-3	368	312	335[a]	325	-10	384	328	355[a]	337	-18
1-15-65	M.F.	-	44.2	42.4	43.6	43.7	+0.1	13.1	12.0	12.8	12.5	-0.3	147	90	120	113	-7	368	288	349[a]	348	- 1	384	320	351[a]	355	- 4
Current mill average:					42.9	43.0	-0.1			12.3	12.2	-0.1			118	116	-2			341	324	-17			361	346	-15
Cumulative mill average:					42.7					12.5					113					318					361		
Mill factor, %					100.5					98.4					104.4					107.2					100.0		
Mill index, %					100.2					96.9					106.3					102.1					94.8		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XIV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL K

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
11-12-64	----	1	42.2	41.6	42.0	42.2	+0.2	13.0	12.2	12.6	13.1	+0.5	142	91	117	114	-3	304	240	272	268	4	352	288	328[a]	357	+29
11-21-64	----	1	42.4	42.0	42.2	42.1	-0.1	13.0	12.0	12.4	13.0	+0.6	125	90	110	112	+2	288	224	260	236	-24	336	296	319[a]	337	+18
11-28-64	----	1	42.0	41.4	41.7	41.9	+0.2	13.4	12.4	13.0	13.2	+0.2	130	77	104	108	+4	312	240	270	273	+ 3	400	312	348[a]	343	- 5
12- 3-64	----	1	43.2	41.8	42.2	42.3	+0.1	13.2	12.4	12.9	12.8	-0.1	143	90	119	123	+4	352	304	327	299	-28	432	352	361[a]	357	-24
12-12-64	----	1	43.8	42.2	42.8	42.4	-0.4	13.2	12.6	12.9	13.1	+0.2	128	84	107	112	+5	352	264	313[a]	266	-47	408	336	365[a]	354	-11
12-20-64	----	1	43.8	43.2	43.6	42.4	-1.2	14.0	12.9	13.4	13.3	-0.1	129	80	110	112	+2	352	272	319	263	-56	424	344	373[a]	351	-22
Current mill average:					42.4	42.2	-0.2			12.9	13.1	+0.2			111	113	+2			293	268	-25			353	350	- 3
Cumulative mill average:					42.4					12.9					113					292					355		
Mill factor, %					100.0					100.0					98.2					100.3					99.4		
Mill index, %					99.1					101.6					100.0					87.7					92.7		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL L

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
9- 5-64	M.F.	2	42.2	41.6	42.0	42.0	0.0	12.1	11.3	11.8	11.4	-0.4	126	100	113	109	- 4	336	256	303	302	- 1	352	312	329[a]	347	+18
9-21-64	M.F.	2	44.0	43.4	43.8	43.7	-0.1	12.7	11.2	11.8	11.5	-0.3	129	92	111	108	- 3	320	240	286	296	+10	376	320	342[a]	339	- 3
9-26-64	M.F.	2	43.2	41.8	42.3	42.3	0.0	12.1	11.4	11.9	11.6	-0.3	131	97	110	111	+ 1	352	240	313	313	0	368	312	344[a]	336	- 8
10- 8-64	M.F.	1	44.0	41.4	42.2	42.1	-0.1	12.8	11.8	12.1	12.0	-0.1	140	108	124	110	-14	384	272	326	296	-30	424	336	378[a]	365	-13
10-17-64	M.F.	1	44.0	41.2	42.2	42.2	0.0	12.9	11.9	12.3	12.0	-0.3	135	102	118	110	- 8	352	272	315	285	-30	448	352	376[a]	369	- 7
10-26-64	M.F.	1	43.2	40.8	42.0	42.2	+0.2	12.5	11.7	12.1	12.0	-0.1	134	94	116	110	- 6	384	272	332	295	-37	432	336	385[a]	367	-18
11- 1-64	M.F.	1	44.0	41.2	42.4	42.6	+0.2	12.9	11.7	12.2	12.1	-0.1	137	90	118	110	- 8	344	248	310[a]	297	-13	400	344	362[a]	375	+13
11-14-64	M.F.	1	43.8	41.0	42.2	42.3	+0.1	13.0	11.9	12.3	12.0	-0.3	129	90	117	112	- 5	368	272	313	289	-24	416	352	374[a]	373	- 1
11-25-64	M.F.	1	44.0	41.6	42.4	42.5	+0.1	12.6	11.9	12.1	11.9	-0.2	136	101	119	111	- 8	368	256	304	287	-17	432	320	369[a]	358	-11
12- 9-64	M.F.	1	43.0	41.6	42.1	42.4	+0.3	12.6	11.8	12.2	12.0	-0.2	137	103	122	111	-11	384	256	312	281	-31	432	336	376[a]	359	-17
Current mill average:					42.4	42.4	0.0			12.1	11.8	-0.3			117	110	- 7			311	294	-17			364	359	- 5
Cumulative mill average:					43.0					12.2					113					301					354		
Mill factor, %					98.6					99.2					103.5					103.3					100.0		
Mill index, %					99.1					95.3					105.4					93.1					95.5		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XVI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL M

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
11- 3-64	WFLS	2	44.0	42.6	43.6	43.2	-0.4	12.8	11.9	12.2	11.9	-0.3	132	87	115	117	-2	368	312	337	365	+28	432	352	387[a]	456	+69
11-19-64	WFLS	2	44.0	42.2	43.3	43.4	-0.1	13.0	12.0	12.5	12.4	-0.1	133	86	112	107	-5	392	280	326[a]	364	+38	424	344	396[a]	446	+50
11-25-64	WFLS	2	42.6	41.8	42.1	43.1	+1.0	13.1	12.3	12.8	12.5	-0.3	129	83	106	114	+8	408	304	353	368	+15	448	368	405[a]	459	+54
11-26-64	WFLS	2	42.4	42.0	42.1	42.6	+0.5	13.0	11.9	12.2	12.3	+0.1	130	82	106	111	+5	416	296	331	347	-16	448	336	395[a]	440	+45
11-26-64	WFLS	2	43.8	42.0	42.5	43.1	+0.6	12.8	12.1	12.4	11.9	-0.5	134	86	109	109	0	384	256	318	330	+12	464	352	396[a]	432	+36
12- 3-64	WFLS	2	44.0	42.2	43.6	42.7	-0.9	14.1	13.0	13.4	12.7	-0.7	137	96	118	116	-2	400	304	333	355	+22	464	352	412[a]	423	+11
12-10-64	WFLS	2	44.0	42.8	43.6	43.2	-0.4	13.2	12.3	12.7	12.6	-0.1	141	86	116	107	-9	416	304	351	314	-37	464	368	407[a]	417	+10
12-11-64	----	2	43.8	41.8	42.5	42.2	-0.3	13.0	12.0	12.6	12.0	-0.6	137	84	112	110	-2	416	320	355	343	-12	448	352	395[a]	418	+23
Current mill average:					42.9	42.9	0.0			12.6	12.3	-0.3			112	111	-1			338	348	-10			399	436	+37
Cumulative mill average:					42.7					12.9					112					342					398		
Mill factor, %					100.5					97.7					100.0					98.8					100.3		
Mill index, %					100.2					99.2					100.9					101.2					104.7		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XVII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL N

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
12- 1-64	WF1S	1	43.6	42.0	42.6	42.6	0.0	14.1	12.0	12.8	12.4	-0.4	147	91	119	124	+5	400	288	367[a]	310	-57	472	368	417[a]	377	-40
11-30-64	WF1S	1	43.0	41.8	42.2	42.2	0.0	13.1	11.1	12.4	12.3	-0.1	155	98	127	136	+9	432	288	369[a]	312	-57	464	368	413[a]	378	-35
12-20-64	WF1S	1	43.2	40.2	41.9	41.6	-0.1	13.2	12.0	12.7	12.3	-0.4	142	83	107	102	-5	464	312	387[a]	354	-33	464	352	407[a]	402	- 5
Current mill average:					42.2	42.2	0.0			12.6	12.3	-0.3			118	121	+3			374	325	-49			412	386	-26
Cumulative mill average:					42.3					12.5					113					348					391		
Mill factor, %					99.8					100.8					104.4					107.5					105.4		
Mill index, %					98.6					99.2					106.3					112.0					108.1		

TABLE XVIII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL O

No samples submitted.

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XIX

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL P

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
12-22-64	MFIS	1	43.0	41.8	42.3	42.1	-0.2	12.8	12.0	12.2	12.0	-0.2	133	90	116	119	+3	440	304	346[a]	351	+ 5	424	336	366[a]	385	- 1
12-23-64	M.F.	1	43.0	42.0	42.6	42.2	-0.4	12.8	12.0	12.4	12.0	-0.4	140	97	115	118	+3	432	296	349[a]	299	-50	480	376	403[a]	352	-51
1- 1-65	MFIS	1	42.6	41.6	42.1	42.0	-0.1	12.2	11.1	11.9	11.8	0.0	146	98	120	117	-3	392	272	327[a]	341	+14	416	352	382[a]	386	+ 4
1- 1-65	MFIS	1	43.2	42.2	42.6	42.9	-0.3	12.9	12.0	12.3	12.1	-0.2	135	99	118	114	-4	376	288	337[a]	333	- 4	408	336	373[a]	385	+12
Current mill average:					42.4	42.2	-0.2			12.2	12.0	-0.2			117	117	0			340	331	- 9			386	377	- 9
Cumulative mill average:					42.9					12.1					119					341					374		
Mill factor, %					98.8					100.8					103.5					99.7					103.2		
Mill index, %					99.1					96.1					105.4					101.8					101.3		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XX

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL Q

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb. Institute Max.	Min.	Av.	Mill Av.	Diff.	Caliper, points Institute Max.	Min.	Av.	Mill Av.	Diff.	Bursting Strength, p.s.i.g. Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet In Machine Institute Max.	Min.	Av.	Mill Av.	Diff.	Elmendorf Tear, g./sheet Cross Machine Institute Max.	Min.	Av.	Mill Av.	Diff.
11- 6-64	----	-	42.4	41.6	42.0	42.5	+0.5	12.5	11.5	12.0	12.0	0.0	121	86	106	102	-4	416	336	373	377	+ 4	496	368	401[a]	397	- 4
11-20-64	----	-	43.8	42.0	42.8	42.6	-0.2	13.0	11.4	12.3	11.9	-0.4	124	84	104	102	-2	400	328	365	352	-13	448	360	394[a]	388	- 6
12- 1-64	----	-	44.0	42.4	43.6	43.3	-0.3	12.1	11.1	11.8	11.8	0.0	120	82	107	104	-3	432	320	362	354	- 8	424	360	395[a]	397	+ 2
12- 9-64	----	-	42.6	41.6	41.9	41.5	-0.4	11.6	10.1	11.0	10.7	-0.3	124	100	111	109	-2	400	272	352	323	-29	432	320	367[a]	348	-19
12-22-64	----	-	43.8	42.0	42.7	42.9	+0.2	12.1	10.6	11.6	11.4	-0.2	127	87	104	107	+3	392	304	351	333	-18	376	328	361[a]	354	- 7
12-31-64	----	-	46.0	42.2	44.3	43.8	-0.5	12.1	11.2	11.8	11.5	-0.3	140	87	110	107	-3	448	304	376	364	-12	416	304	373[a]	371	- 2
1-12-65	----	-	43.8	42.2	43.0	42.6	-0.4	13.2	11.1	12.2	11.6	-0.6	119	89	105	103	-2	416	336	373	362	-11	448	368	407[a]	396	-11
Current mill average:					42.9	42.7	-0.2			11.8	11.6	-0.2			107	105	-2			365	352	-13			386	379	- 7
Cumulative mill average:					43.0					12.3					103					359					393		
Mill factor, %					99.8					95.9					103.9					101.7					98.2		
Mill index, %					100.2					92.9					96.4					109.3					101.3		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL S

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
11-23-64	MFIS	2	43.8	41.4	42.5	43.0	+0.5	13.4	12.2	12.8	13	+0.2	139	85	108	112	+4	352	272	317	304	-13	400	328	363[a]	368	+ 5
12- 1-64	MFIS	2	43.0	40.8	41.9	42.0	+0.1	12.9	11.5	12.2	12.5	+0.3	135	92	111	106	-5	352	224	305[a]	280	-25	400	320	363[a]	416	+53
12- 7-64	MFIS	2	43.6	41.8	42.5	43.5	+1.0	13.3	12.4	12.9	13	+0.1	133	95	116	110	-6	368	224	312[a]	280	-32	400	320	353[a]	360	+ 7
12-15-64	MFIS	2	43.8	42.2	42.6	42.8	+0.2	12.9	12.0	12.4	13	+0.6	143	100	122	114	-8	384	224	325[a]	264	-61	432	320	367[a]	392	+25
12-23-64	MFIS	2	44.0	42.4	43.5	42.8	-0.7	13.9	12.8	13.2	13	-0.2	144	85	113	109	-4	384	272	329[a]	320	- 9	400	336	377[a]	368	- 9
12-29-64	MFIS	2	44.0	42.8	43.4	42.0	-1.4	14.2	12.5	13.3	12.5	-0.8	134	82	105	105	0	432	280	344[a]	256	-88	448	320	364[a]	352	-32
1- 7-65	MFIS	2	43.0	41.6	42.1	42.2	+0.1	13.9	12.1	12.9	12.5	-0.4	140	86	109	104	-5	352	264	311[a]	272	-39	480	320	367[a]	368	+ 1
1-12-65	MFIS	2	42.8	41.8	42.1	42.0	-0.1	13.7	12.1	12.9	12.7	-0.2	144	87	114	108	-6	384	304	339[a]	288	-51	400	320	371[a]	376	+ 5
Current mill average:					42.6	42.5	-0.1			12.8	12.8	0.0			112	108	-4			323	283	-40			368	375	+ 7
Cumulative mill average:					42.5					13.0					110					305					351		
Mill factor, %					100.2					98.5					101.8					105.9					104.8		
Mill index, %					99.5					100.8					100.9					96.7					96.6		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL T

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
10- 5-64	W.F.	1	44.2	43.0	43.6	43.4	-0.2	12.8	12.0	12.4	12.2	-0.2	137	86	112	107	-5	384	320	348[a]	340	- 8	416	336	379[a]	390	+11
10-18-64	W.F.	1	44.0	42.6	43.6	43.8	+0.2	13.0	12.1	12.5	12.6	+0.1	132	80	108	113	+5	392	312	367[a]	317	-50	448	328	377[a]	382	+ 5
10- 3-64	W.F.	3	44.0	42.6	43.5	43.1	-0.4	13.0	12.1	12.8	13.1	+0.3	125	95	109	116	+7	392	272	334	306	-28	432	368	390[a]	376	-14
Current mill average:					43.6	43.4	-0.2			12.6	12.6	0.0			110	112	+2			350	321	-29			382	382	0
Cumulative mill average:					43.5					12.7					112					338					390		
Mill factor, %					100.2					99.2					98.2					103.6					97.9		
Mill index, %					101.9					99.2					99.1					104.8					100.3		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXIII

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL U

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
11-18-64	WFlS	1	43.4	41.8	42.2	42.7	+0.5	13.9	11.8	12.5	12.1	-0.4	129	92	108	105	-3	384	264	304[a]	333	+29	408	360	383[a]	408	+25
11-24-64	WFlS	1	43.0	41.6	42.1	42.2	+0.1	13.0	11.8	12.3	12.2	-0.1	128	94	110	106	-4	344	256	297	337	+40	432	352	389[a]	406	-17
12- 1-64	WFlS	1	43.4	41.4	42.3	42.3	0.0	13.5	12.1	12.6	12.3	-0.3	127	84	108	109	+1	352	264	307	328	+21	416	368	392[a]	405	+13
12- 8-64	WFlS	1	43.2	41.2	42.1	42.5	+0.4	12.8	11.4	12.2	12.3	+0.1	122	89	108	110	+2	336	256	307[a]	324	+17	456	320	375[a]	401	+26
12-15-64	WFlS	1	43.8	42.0	42.9	42.6	-0.3	13.0	11.7	12.5	12.2	-0.3	130	86	113	104	-9	368	256	301	350	+49	448	352	388[a]	420	+32
12-22-64	WFlS	1	43.8	41.2	42.3	42.4	+0.1	12.7	11.2	12.1	12.2	+0.1	136	89	115	106	-9	384	240	320	333	+13	416	344	376[a]	409	+33
1- 5-65	WFlS	1	42.6	41.6	42.0	42.4	+0.4	13.0	11.5	12.3	12.1	-0.2	141	96	112	108	-4	384	272	314	317	+ 3	448	320	374[a]	383	+ 9
1-12-65	WFlS	1	42.4	41.2	41.8	42.3	+0.5	13.7	11.6	12.3	12.0	-0.3	133	90	113	108	-5	432	272	323[a]	328	+ 5	464	336	379[a]	391	+12
Current mill average:					42.2	42.4	+0.2			12.4	12.2	-0.2			111	107	-4			309	331	+22			382	403	+21
Cumulative mill average:					42.5					12.3					114					314					379		
Mill factor, %					99.3					100.8					97.4					98.4					100.8		
Mill index, %					98.6					97.6					100.0					92.5					100.3		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXIV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL V

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
11-11-64	W.B.	-	44.0	42.0	43.3	42.9	-0.4	13.0	12.0	12.5	12.2	-0.3	121	82	102	109	+7	512	384	437[a]	388	-49	512	352	398[a]	420	+22
11-27-64	W.B.	-	43.6	42.0	42.4	42.5	+0.1	13.0	11.8	12.4	12.2	-0.2	127	93	108	113	+5	432	304	389[a]	324	-65	480	384	424[a]	377	-47
12- 7-64	W.B.	-	43.8	42.0	42.6	42.4	-0.2	13.6	12.1	12.9	12.7	-0.2	119	78	104	109	+5	448	352	393[a]	320	-73	416	368	399[a]	371	-28
12-12-64	W.B.	-	43.0	41.8	42.2	42.2	0.0	12.8	11.3	12.0	12.0	0.0	125	83	109	110	+1	416	320	368[a]	345	-23	464	384	428[a]	381	-47
12-12-64	W.B.	-	42.6	40.0	41.8	42.1	+0.3	13.3	12.0	12.8	12.7	-0.1	122	97	108	108	0	416	328	369[a]	323	-46	416	336	389[a]	377	-12
Current mill average:					42.5	42.4	-0.1			12.5	12.4	-0.1			106	110	+4			391	340	-51			408	385	-23
Cumulative mill average:					42.6					12.4					110					372					410		
Mill factor, %					99.8					100.8					96.4					105.1					99.5		
Mill index, %					99.3					98.4					95.5					117.1					107.1		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL W

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
10-31-64	W.B.	-	44.0	41.8	42.8	41.9	-0.9	11.8	10.8	11.3	11.0	-0.3	114	86	102	104	+2	432	304	355	300	-55	416	344	387[a]	368	-19
11- 3-64	W.B.	-	44.2	42.2	43.3	42.5	-0.8	11.8	10.3	11.3	11.0	-0.3	134	88	110	111	+1	400	312	361[a]	319	-42	472	368	420[a]	375	-45
11- 9-64	W.B.	-	44.2	41.8	42.9	42.3	-0.6	12.5	10.3	11.5	11.2	-0.3	128	84	106	106	0	416	320	368[a]	345	-23	440	360	407[a]	432	-25
11-30-64	W.B.	-	43.4	41.8	42.3	42.1	-0.2	12.0	11.1	11.5	11.4	-0.1	120	88	105	109	+4	432	296	373	324	-49	472	368	411[a]	409	- 2
12- 9-64	W.B.	-	45.2	41.4	43.3	42.5	-0.8	12.1	11.1	11.6	11.2	-0.4	132	82	107	107	0	448	352	392	299	-93	496	400	443[a]	399	-44
12-11-64	W.B.	-	44.0	40.2	42.0	41.8	-0.2	11.7	10.8	11.2	10.8	-0.4	122	83	110	107	-3	400	336	369	295	-74	480	384	424[a]	384	-40
Current mill average:					42.8	42.2	-0.6			11.4	11.1	-0.3			107	107	0			370	314	-56			415	394	-21
Cumulative mill average:					42.7					11.5					109					369					409		
Mill factor, %					100.2					99.1					98.2					100.3					101.5		
Mill index, %					100.0					89.8					96.4					110.8					108.9		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

TABLE XXVI

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL X

December, 1964, and January, 1965

Date Made	Finish	Mch. No.	Basis Weight, lb.					Caliper, points					Bursting Strength, p.s.i.g.					Elmendorf Tear, g./sheet In Machine					Elmendorf Tear, g./sheet Cross Machine				
			Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill		Institute			Mill	
			Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.	Max.	Min.	Av.	Av.	Diff.
11-10-64	----	1	42.8	41.8	42.2	42.8	+0.6	13.2	12.7	13.0	12.8	-0.2	131	94	109	108	-1	320	232	274[a]	278	+ 4	336	280	311[a]	371	+60
11-17-64	----	1	42.2	42.0	42.1	42.6	+0.5	13.5	12.1	12.8	12.6	-0.2	134	93	115	111	-4	352	240	285	297	+12	368	304	335[a]	352	+17
11-28-64	----	1	43.4	42.0	42.3	42.7	+0.4	13.2	12.0	12.7	12.4	-0.3	130	91	112	103	-9	344	240	298[a]	303	+ 5	384	328	359[a]	359	0
Current mill average:					42.2	42.7	+0.5			12.8	12.6	-0.2			112	107	-5			286	293	+ 7			335	361	+26
Cumulative mill average:					42.8					12.8					115					280					344		
Mill factor, %					98.6					100.0					97.4					102.1					97.4		
Mill index, %					98.6					100.8					100.9					85.6					87.9		

[a]This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

data described above, Tables IV through XXVI also include under each test heading a column labeled "Diff." This column shows the differences between averages obtained at the Institute and those obtained at the mills. The data obtained at the Institute are used as the reference in calculating these differences.

The average test results obtained at the Institute and at the mills are summarized in Table XXVII for the current period. Shown in this table for each mill is the difference for each test between the current mill average based on Institute data and the current mill average based on mill data. In addition, for each test the maximum difference encountered in comparing Institute and mill averages for individual sample lots is shown. In Table XXVIII, the differences for each test between the current mill averages based on Institute data and those based on mill data shown in Table XXVII have been converted to per cent (based on Institute data as a reference). In addition, for purposes of comparison, the percentage differences from the previous bimonthly report are shown in Table XXVIII.

A summary of the agreement obtained in the comparisons of Institute and mill test data for the current period is shown in Table XXIX. This summary is based on the results given in Table XXVIII. The tabulated data show the number of mills, and the percentage of all mills which this number represents, whose average test results for the current period fall within designated percentages from the average test results obtained at the Institute. It may be noted from this summary that agreement between the results obtained at the Institute and those obtained at the mills was generally good.

Preconditioning and conditioning data pertinent to the test results obtained at the mills during the current period are given in Table XXX.

TABLE XXVII

SUMMARY OF TEST RESULT COMPARISONS (AVERAGE MILL AND INSTITUTE RESULTS) FOR DECEMBER, 1964 AND JANUARY, 1965

Mills[a]	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	S	T	U	V	W	X
No. of samples compared	8	4	3	6	0	11	7	8	0	8	6	10	8	3	0	4	7	8	3	8	5	6	3
Basis Weight																							
Institute	43.0	43.2	42.4	42.3		42.3	42.8	42.2		42.9	42.4	42.4	42.9	42.2		42.4	42.9	42.6	43.6	42.2	42.5	42.8	42.2
Mill	42.8	43.4	42.1	42.4		42.3	42.9	42.4		43.0	42.2	42.4	42.9	42.2		42.2	42.7	42.5	43.4	42.4	42.4	42.2	42.7
Av. Diff.[b]	-0.2	+0.2	-0.3	+0.1		0.0	+0.1	+0.2		+0.1	-0.2	0.0	0.0	0.0		-0.2	-0.2	-0.1	-0.2	+0.2	-0.1	-0.6	+0.5
Max. Diff.[c]	-0.5	+0.5	-0.5	+0.3		+0.6	+0.5	+0.7		+0.8	-1.2	+0.3	+1.0	-0.1		-0.4	±0.5	-1.4	-0.4	+0.5	-0.4	-0.9	+0.6
Caliper																							
Institute	12.4	13.4	12.7	12.8		12.9	13.2	12.8		12.3	12.9	12.1	12.6	12.6		12.2	11.8	12.8	12.6	12.4	12.5	11.4	12.8
Mill	12.3	13.6	12.4	13.0		12.7	12.8	12.7		12.2	13.1	11.8	12.3	12.3		12.0	11.6	12.8	12.6	12.2	12.4	11.1	12.6
Av. Diff.[b]	-0.1	+0.2	-0.3	+0.2		-0.2	-0.4	-0.1		-0.1	+0.2	-0.3	-0.3	-0.3		-0.2	-0.2	-0.0	0.0	-0.2	-0.1	-0.3	-0.2
Max. Diff.[c]	-0.5	+0.3	-0.5	+0.2		-0.8	-0.5	-0.2		-0.5	+0.6	-0.4	-0.7	-0.4		-0.4	-0.6	-0.8	+0.3	-0.4	-0.3	-0.4	-0.3
Bursting Strength																							
Institute	110	109	116	114		104	110	111		118	111	117	112	118		117	107	112	110	111	106	107	112
Mill	107	108	116	111		107	109	111		116	113	110	111	121		117	105	108	112	107	110	107	107
Av. Diff.[b]	-3	-1	0	-3		+3	-1	0		-2	+2	-7	-1	+3		0	-2	-4	+2	-4	+4	0	-5
Max. Diff.[c]	-6	±3	-1	-4		+9	-5	±4		-7	+5	-14	-9	+9		-4	-4	-8	+7	-9	+7	+4	-9
Tearing Strength, in																							
Institute	376	399	337	326		318	336	329		341	293	311	338	374		340	365	323	350	309	391	370	286
Mill	--	372	--	318		283	344	303		324	268	294	348	325		331	352	283	321	331	340	314	293
Av. Diff.[b]	--	-27	--	-8		-35	+8	-26		-17	-25	-17	+10	-49		-9	-13	-40	-29	+22	-51	-56	+7
Max. Diff.[c]	--	-45	--	-21		-76	+33	-57		-34	-56	-37	+38	-57		-50	-29	-88	±50	+49	-73	-93	+12
Tearing Strength, cross																							
Institute	412	426	368	397		366	398	387		361	353	364	399	412		386	386	368	382	382	408	415	335
Mill	--	426	--	395		354	402	380		346	350	359	436	386		377	379	375	382	403	385	394	361
Av. Diff.[b]	--	0	--	-2		-12	+4	-7		-15	-3	-5	+37	-26		-9	-7	+7	0	+21	-23	-21	+26
Max. Diff.[c]	--	-10	--	-13		-45	+31	-36		-30	+29	±18	+69	-40		-51	-19	+53	-14	+33	-47	-45	+60

[a] Comparison based on averages involved only those samples on which mill test data were submitted.
[b] Average difference is the difference between the Institute mill average and the mill average based on mill test data.
[c] Maximum difference encountered in comparing the Institute average and the mill averages for any sample submitted by that particular mill.

TABLE XXVIII

COMPARISON OF INSTITUTE-MILL DIFFERENCES FOR DECEMBER, 1964 AND JANUARY, 1965
Average Difference, ¢

Mill	Period	Basis Weight	Caliper	Bursting Strength	Tear, in	Tear, cross	Mill	Period	Basis Weight	Caliper	Bursting Strength	Tear, in	Tear, cross
A	Aug.-Sept.	-0.5	-0.8	-2	--	--	M	Aug.-Sept.	+0.7	-2	-4	+2	+8
	Oct.-Nov.	-0.5	-0.8	-2	--	--		Oct.-Nov.	+0.2	-4	+5	-0.9	+7
	Current	-0.5	-0.8	-3	--	--		Current	0	-2	-0.9	+3	+9
B	Aug.-Sept.	+0.2	+2	-2	-8	-1	N	Aug.-Sept.	+0.7	-2	0	-8	-7
	Oct.-Nov.	-0.2	+2	0	-2	+2		Oct.-Nov.	+0.7	-2	+2	-8	-4
	Current	+0.5	+1	-0.9	-7	0		Current	0	-2	+3	-13	-6
C	Aug.-Sept.	-0.5	-2	-2	--	--	O	Aug.-Sept.	--	--	--	--	--
	Oct.-Nov.	-0.5	-3	+5	--	--		Oct.-Nov.	--	--	--	--	--
	Current	-0.7	-2	0	--	--		Current	--	--	--	--	--
D	Aug.-Sept.	+0.5	0	-0.9	-3	+0.5	P	Aug.-Sept.	-2	-2	+2	-2	+3
	Oct.-Nov.	+0.2	0	0	-5	-3		Oct.-Nov.	-0.5	-3	+2	-9	-5
	Current	+0.2	+2	-3	-2	-0.5		Current	-0.5	-2	0	-3	-2
E	Aug.-Sept.	--	--	--	--	--	Q	Aug.-Sept.	+0.2	-5	+2	-2	+0.8
	Oct.-Nov.	--	--	--	--	--		Oct.-Nov.	-0.2	-4	0	+1	-1
	Current	--	--	--	--	--		Current	-0.5	-2	-2	-4	-2
F	Aug.-Sept.	+2	0	+2	+8	+10	S	Aug.-Sept.	+1	-0.8	-3	0	+8
	Oct.-Nov.	+0.9	-2	+4	-0.6	+5		Oct.-Nov.	+0.7	-2	+7	+2	+15
	Current	0	-2	+3	-11	-3		Current	-0.2	0	-4	-12	+2
G	Aug.-Sept.	-0.7	-3	0	+14	+10	T	Aug.-Sept.	+0.7	-0.8	-0.9	-5	+2
	Oct.-Nov.	+0.5	-4	0	+6	+4		Oct.-Nov.	+0.9	-2	+0.9	0	+2
	Current	+0.2	-3	-0.9	+2	+1		Current	-0.5	0	+2	-8	0
H	Aug.-Sept.	+1	-2	-2	-7	-2	U	Aug.-Sept.	+0.9	0	-6	+11	+12
	Oct.-Nov.	+0.7	-0.8	+0.9	-5	+4		Oct.-Nov.	+0.9	-2	-2	+7	+5
	Current	+0.5	-0.8	0	-8	-2		Current	+0.5	-2	-4	+7	+5
I	Aug.-Sept.	---	--	--	--	---	V	Aug.-Sept.	0	-0.8	+2	-9	-2
	Oct.-Nov.	--	--	--	--	--		Oct.-Nov.	0	-0.8	+5	-10	-3
	Current	--	--	--	--	--		Current	-0.2	-0.8	+4	-13	-6
J	Aug.-Sept.	+0.9	-0.8	0	-2	+0.6	W	Aug.-Sept.	-0.7	-2	-4	-14	-3
	Oct.-Nov.	+0.7	-0.8	-2	-4	-3		Oct.-Nov.	-0.2	-4	0	-7	+1
	Current	+0.2	-0.8	-2	-5	-4		Current	-1	-3	0	-15	-5
K	Aug.-Sept.	0	+2	-0.9	-9	-1	X	Aug.-Sept.	+0.5	-2	0	+15	+15
	Oct.-Nov.	-0.5	+0.8	+2	-9	+0.6		Oct.-Nov.	+0.5	-3	-0.9	+7	+8
	Current	-0.5	+2	+2	-9	-0.8		Current	+1	-2	-4	+2	+8
L	Aug.-Sept.	-0.9	-2	+2	-6	-2							
	Oct.-Nov.	0	-2	+3	-9	-4							
	Current	0	-2	-6	-5	-1							

TABLE XXIX

SUMMARY OF AGREEMENT BETWEEN INSTITUTE AND MILL RESULTS
FOR DECEMBER, 1964 AND JANUARY, 1965

	Average Percentage Difference Between Institute and Mill Test Results[a]								
	±0.5	±1	±2	±3	±4	±5	±7.5	±10	±15
Basis weight									
Number of mills	17	20							
Percentage of mills	85.0	100.0							
Caliper									
Number of mills	2	7	18	20					
Percentage of mills	10.0	35.0	90.0	100.0					
Bursting strength									
Number of mills	4	7	11	15	19	19	20		
Percentage of mills	20.0	35.0	55.0	75.0	95.0	95.0	100.0		
Tearing strength, in									
Number of mills	0	0	3	5	6	8	10	13	18
Percentage of mills	0.0	0.0	16.7	27.8	33.3	44.4	55.6	72.2	100.0
Tearing strength, cross									
Number of mills	3	6	10	11	12	14	16	18	
Percentage of mills	16.7	33.3	55.6	61.1	66.7	77.8	88.9	100.0	

[a]Based on the average percentage differences between Institute and mill data given in Table XXVIII.

TABLE XXX

PRECONDITIONING AND CONDITIONING DATA FOR MILL TESTS
DECEMBER, 1964 AND JANUARY, 1965

Mill Code	Preconditioning			Conditioning		
	R.H., %	Temp., °F.	Time, hr.	R.H., %	Temp., °F.	Time, hr.
A	50	73	48	50	73	24-192
B	--	--	--	50	73	24
C	--	--	--	50-56	70-72	2
D	50	73	24	50	73	24
E[b]	--	--	--	--	--	--
F	47-50	72-74	24-720	47-50	72-74	3-60
G	50	73	24	50	73	25
H	35	73	48	50	73	48
I[b]	--	--	--	--	--	--
J	34-36	77-78	8	48-52	72-73	16
K	--	--	--	47-56	68-81	--
L	38-47	65-86	0.5	50	72-73	24
M	50	70-72	120	50	70-72	120
N[b]	50-53	72-73	144-384	--	--	--
O[b]	--	--	--	--	--	--
P	50	72	24	50	72-73	24
Q[a]	--	--	--	--	--	--
S	50	72	24	--	--	--
T	--	--	--	50	73	24
U	--	--	--	55	71-72	--
V	51-52	72-74	48	50	73	48
W	--	--	--	45-52	73-75	48
X	50	72	72	50	72	72

[a] No data were submitted relative to preconditioning and conditioning.

[b] No samples were submitted for evaluation during the current period.

THE INSTITUTE OF PAPER CHEMISTRY

W. N. Hubert, Research Aide

R. C. McKee, Chairman
Container Section